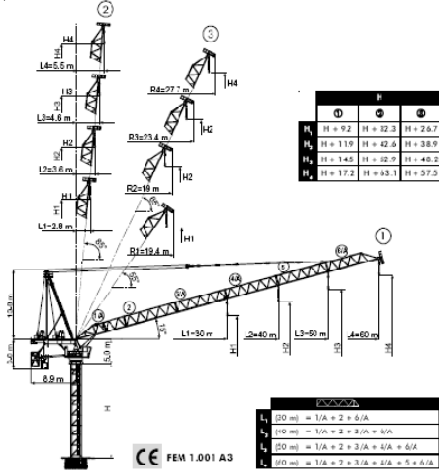


Appendix H

Construction Management Breadth Studies

- Gru a torre a braccio impennabile
- Luffing Jib Tower Crane • Grue à tour à flèche relevable
- Turmdrehkrane mit Stellstellung-Ausleger
- Grúa torre de pluma abatible



| H | H | H |
|---------|----------|----------|
| H = 92 | H = 32.3 | H = 26.7 |
| H = 119 | H = 42.6 | H = 38.9 |
| H = 145 | H = 52.9 | H = 48.2 |
| H = 172 | H = 63.1 | H = 57.2 |

| L | L | L |
|---|---|---|
| L (20 m) = 1(A + 2) + 6(A) | | |
| L (30 m) = 1(A + 2) + 8(A) + 6(A) | | |
| L (50 m) = 1(A + 2) + 3(A) + 5(A) + 6(A) | | |
| L (70 m) = 1(A + 2) + 3(A) + 2(A) + 5(A) + 6(A) | | |

CE FEM 1.001 A3

Dis. (Modificazioni progettuali) / Confezionato mod. per usi speciali / Subject to modification without notice / registeren over technische specificaties of / Änderungen vorbehalten ohne weitere Mitteilung.

Specificazioni e dati di carico / Subject to modification without notice / L'utente assume la responsabilità / Modificazioni senza preavviso.

Divise techniques et données techniques / Modifications reserves sans préavis.

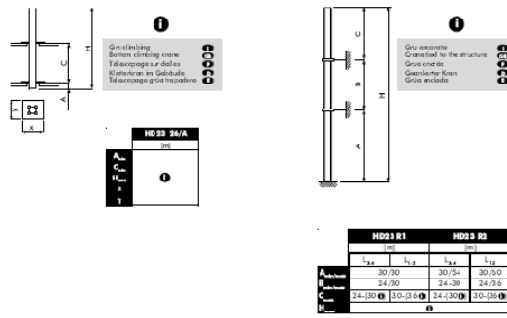
This information is for reference use only. Operator manual should be consulted and adhered to. Please contact Bigge Crane and Rigging Co. at 888-337-BIGGE or email towers@bigge.com for further information.

CTL 630-32 HD23

Diagramma di portata / Load Diagram / Courbes de charges / Lastkurven

| CTL 630-32 | | 20 | 22 | 25 | 27 | 30 | 35 | 40 | 45 | 50 | 55 | 60 |
|------------|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|
| 16 t | - 35 m | 16,00 | 16,00 | 16,00 | 16,00 | 16,00 | 16,00 | 13,50 | 12,27 | 10,95 | 9,69 | 9,00 |
| 16 t | - 41,9 m | 16,00 | 16,00 | 16,00 | 16,00 | 16,00 | 16,00 | 16,00 | 14,82 | 13,20 | | |
| 32 t | - 21,8 m | 32,00 | 31,78 | 27,80 | 25,64 | 22,93 | 19,65 | 16,85 | 14,82 | 13,20 | | |
| 16 t | - 40 m | 16,00 | 16,00 | 16,00 | 16,00 | 16,00 | 16,00 | 16,00 | | | | |
| 32 t | - 22,6 m | 32,00 | 32,00 | 28,84 | 26,60 | 23,80 | 20,20 | 17,50 | | | | |
| 16 t | - 30 m | 16,00 | 16,00 | 16,00 | 16,00 | 16,00 | | | | | | |
| 32 t | - 22,8 m | 32,00 | 32,00 | 29,08 | 26,82 | 24,00 | | | | | | |

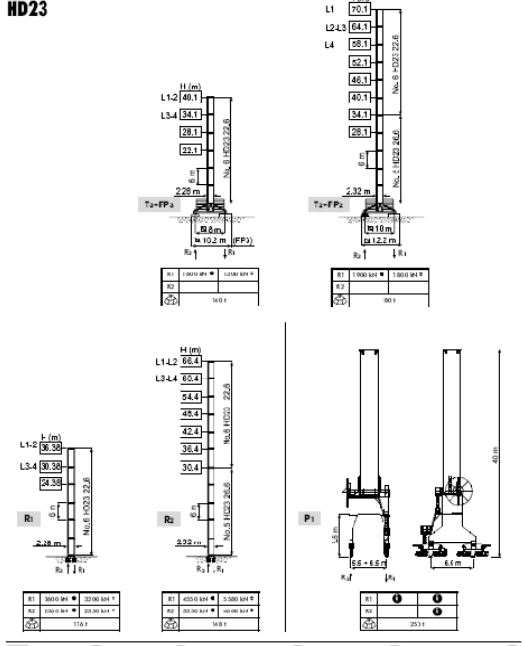
Altre installazioni / Other configurations / Autres implantations / Aufstellmöglichkeiten / Otras implantaciones



| HD23 R1 | | HD23 R2 | |
|----------------|----------------|----------------|----------------|
| L ₁ | L ₂ | L ₁ | L ₂ |
| 30/50 | 30/55 | 30/50 | 30/50 |
| 24/30 | 24/30 | 24/30 | 24/30 |
| 24-30 | 30-30 | 24-30 | 30-30 |

This information is for reference use only. Operator manual should be consulted and adhered to. Please contact Bigge Crane and Rigging Co. at 888-337-BIGGE or email towers@bigge.com for further information.

Torre / Tower / Tour / Tour / Torre



Altre misure / Other measures / Autres mesures / Weitere Maße / Outras medidas

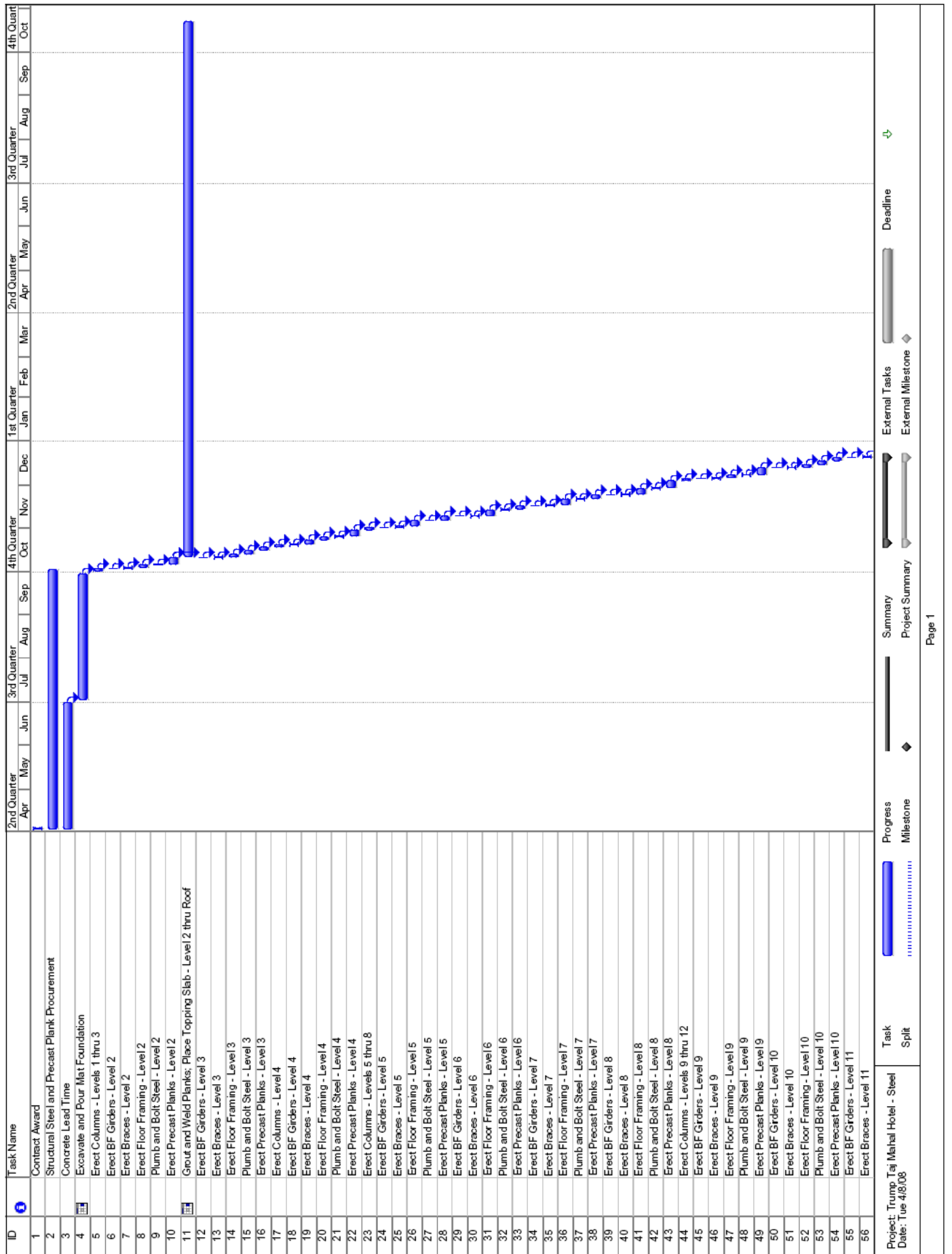
This information is for reference use only. Operator manual should be consulted and adhered to. Please contact Bigge Crane and Rigging Co. at 888-337-BIGGE or email towers@bigge.com for further information.

Mecanismi / Mechanisms / Mécanismes / Antriebe / Mecanismos

| Model | Capacity | Speed | Height | Width | Length |
|---------------|----------|--------------|--------|-------|--------|
| SRWB 102 60/S | 30 t | 400 V, 50 Hz | 100 | 600 m | |
| SRWB 122 60/S | 32 t | 400 V, 50 Hz | 112 | 600 m | |
| 110AWL 160 LC | 16 t | 400 V, 50 Hz | 110 | 340 m | |

Altre informazioni / Other information / Autres informations / Weitere Informationen / Outras informações

This information is for reference use only. Operator manual should be consulted and adhered to. Please contact Bigge Crane and Rigging Co. at 888-337-BIGGE or email towers@bigge.com for further information.





Gravity Beam Design Takeoff

RAM Steel v11.2
DataBase: Takeoff Model - PLANKS
Building Code: IBC

04/08/08 04:28:46
Steel Code: AISC LRFD

STEEL BEAM DESIGN TAKEOFF:

Floor Type: ROOF
Story Level 43
Steel Grade: 50

| SIZE | # | LENGTH (ft) | WEIGHT (lbs) |
|---------|-----------|-------------|--------------|
| W12X19 | 17 | 340.98 | 6463 |
| W14X22 | 1 | 28.43 | 628 |
| W18X35 | 6 | 137.92 | 4834 |
| W24X55 | 12 | 345.37 | 19156 |
| W24X68 | 2 | 58.50 | 4001 |
| W36X182 | 1 | 58.50 | 10670 |
| | 39 | | 48751 |

Total Number of Studs = 0

Floor Type: FLR 41 M
Story Level 42
Steel Grade: 50

| SIZE | # | LENGTH (ft) | WEIGHT (lbs) |
|--------|-----------|-------------|--------------|
| W8X10 | 7 | 58.41 | 588 |
| W12X19 | 7 | 108.50 | 2056 |
| W16X26 | 1 | 21.25 | 555 |
| W16X31 | 1 | 20.00 | 621 |
| W18X35 | 2 | 27.75 | 973 |
| W21X44 | 2 | 40.00 | 1769 |
| W24X55 | 2 | 38.50 | 2135 |
| | 22 | | 8699 |

Total Number of Studs = 0

Floor Type: FLR 40 M
Story Level 41
Steel Grade: 50

| SIZE | # | LENGTH (ft) | WEIGHT (lbs) |
|--------|----|-------------|--------------|
| W8X10 | 13 | 128.08 | 1290 |
| W10X12 | 1 | 19.75 | 238 |
| W12X14 | 1 | 9.75 | 131 |
| W8X18 | 2 | 49.52 | 886 |



Gravity Beam Design Takeoff

RAM Steel v11.2
DataBase: Takeoff Model - PLANKS
Building Code: IBC

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04/08/08 04:28:46
Steel Code: AISC LRFD

| SIZE | # | LENGTH (ft) | WEIGHT (lbs) |
|--------|-----------|-------------|--------------|
| W8X10 | 16 | 193.16 | 1946 |
| W10X12 | 1 | 16.00 | 193 |
| W12X14 | 1 | 9.25 | 131 |
| W12X16 | 3 | 56.25 | 902 |
| W8X18 | 1 | 29.17 | 522 |
| W12X19 | 23 | 416.00 | 7885 |
| W14X22 | 6 | 114.75 | 2534 |
| W16X26 | 4 | 76.77 | 2006 |
| W18X35 | 11 | 230.81 | 8089 |
| W21X44 | 4 | 83.26 | 3683 |
| W18X50 | 2 | 58.60 | 2931 |
| W24X62 | 1 | 32.00 | 1993 |
| W24X76 | 7 | 256.00 | 19513 |
| | 80 | | 52327 |

Total Number of Studs = 0

Floor Type: FLR 3
Story Level 2
Steel Grade: 50

| SIZE | # | LENGTH (ft) | WEIGHT (lbs) |
|--------|-----------|-------------|--------------|
| W8X10 | 15 | 181.16 | 1825 |
| W12X14 | 2 | 37.25 | 527 |
| W12X16 | 1 | 19.75 | 317 |
| W12X19 | 5 | 87.52 | 1659 |
| W14X22 | 2 | 37.00 | 817 |
| W16X26 | 4 | 77.00 | 2012 |
| W18X35 | 11 | 234.72 | 8127 |
| W18X40 | 3 | 56.04 | 2250 |
| W21X44 | 14 | 255.37 | 11296 |
| W21X48 | 8 | 288.00 | 13818 |
| W21X50 | 2 | 45.25 | 2264 |
| W24X55 | 13 | 247.63 | 13735 |
| | 80 | | 58746 |

Total Number of Studs = 0

Floor Type: FLR 2
Story Level 1
Steel Grade: 50



Gravity Beam Design Takeoff

RAM Steel v11.2
DataBase: Takeoff Model - PLANKS
Building Code: IBC

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04/08/08 04:28:46
Steel Code: AISC LRFD

| SIZE | # | LENGTH (ft) | WEIGHT (lbs) |
|--------|-----------|-------------|--------------|
| W12X19 | 5 | 108.60 | 2058 |
| W14X22 | 5 | 94.52 | 2087 |
| W12X26 | 2 | 80.00 | 2083 |
| W16X26 | 3 | 58.03 | 1517 |
| W16X31 | 4 | 117.49 | 3650 |
| W18X35 | 14 | 274.43 | 9619 |
| W16X36 | 1 | 32.00 | 1134 |
| W18X40 | 2 | 50.50 | 2028 |
| W21X44 | 3 | 56.33 | 2492 |
| W18X46 | 1 | 32.00 | 1470 |
| W21X48 | 2 | 50.75 | 2435 |
| W24X55 | 9 | 176.93 | 9813 |
| W24X68 | 1 | 37.25 | 2548 |
| W27X84 | 8 | 150.00 | 12658 |
| | 77 | | 58157 |

Total Number of Studs = 0

Floor Type: FLR 24 TO 39
Story Levels 25 to 40
Steel Grade: 50

| SIZE | # | LENGTH (ft) | WEIGHT (lbs) |
|--------|-----------|-------------|--------------|
| W8X10 | 14 | 142.33 | 1434 |
| W10X12 | 1 | 19.75 | 238 |
| W12X16 | 4 | 75.00 | 1202 |
| W12X19 | 21 | 376.00 | 7137 |
| W14X22 | 7 | 133.50 | 2948 |
| W16X26 | 4 | 76.77 | 2066 |
| W18X35 | 12 | 268.06 | 9395 |
| W21X44 | 4 | 83.26 | 3683 |
| W18X50 | 2 | 58.60 | 2931 |
| W24X76 | 8 | 288.00 | 21952 |
| | 77 | | 52916 |

Total Number of Studs = 0

Floor Type: FLR 4 TO 23
Story Levels 5 to 24
Steel Grade: 50



Gravity Beam Design Takeoff

RAM Steel v11.2
DataBase: Takeoff Model - PLANKS
Building Code: IBC

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04/08/08 04:28:46
Steel Code: AISC LRFD

| SIZE | # | LENGTH (ft) | WEIGHT (lbs) |
|--------|-----------|-------------|--------------|
| W8X10 | 15 | 181.16 | 1825 |
| W12X14 | 2 | 37.25 | 527 |
| W12X16 | 1 | 19.75 | 317 |
| W8X18 | 1 | 19.62 | 351 |
| W12X19 | 5 | 87.52 | 1659 |
| W14X22 | 2 | 37.00 | 817 |
| W16X26 | 4 | 77.00 | 2012 |
| W16X31 | 1 | 18.21 | 566 |
| W18X35 | 9 | 196.89 | 6901 |
| W14X38 | 2 | 64.00 | 2439 |
| W18X40 | 5 | 136.04 | 5462 |
| W21X44 | 14 | 255.37 | 11296 |
| W21X48 | 4 | 144.00 | 6909 |
| W21X50 | 2 | 45.25 | 2264 |
| W24X55 | 13 | 247.63 | 13735 |
| | 80 | | 57079 |

Total Number of Studs = 0

TOTAL STRUCTURE GRAVITY BEAM TAKEOFF

Steel Grade: 50

| SIZE | # | LENGTH (ft) | WEIGHT (lbs) |
|--------|-----|-------------|--------------|
| W8X10 | 594 | 6689.23 | 67375 |
| W8X18 | 13 | 652.47 | 11678 |
| W10X12 | 37 | 655.75 | 7899 |
| W12X14 | 25 | 268.75 | 3804 |
| W12X16 | 126 | 2364.50 | 37896 |
| W12X19 | 835 | 15069.13 | 285612 |
| W12X26 | 2 | 80.00 | 2083 |
| W14X22 | 242 | 4627.95 | 102204 |
| W14X38 | 2 | 64.00 | 2439 |
| W16X26 | 156 | 2996.99 | 78321 |
| W16X31 | 6 | 155.70 | 4837 |
| W16X36 | 1 | 32.00 | 1154 |
| W18X35 | 454 | 9776.68 | 343659 |
| W18X40 | 10 | 242.58 | 9740 |
| W18X50 | 72 | 2109.65 | 105526 |
| W18X46 | 1 | 32.00 | 1470 |
| W21X48 | 14 | 482.75 | 23162 |
| W21X44 | 177 | 3604.49 | 159449 |
| W21X50 | 4 | 90.51 | 4527 |



Gravity Beam Design Takeoff

RAM Steel v11.2
Data Base: Takeoff Model: PLANKS
Building Code: IBC

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04/08/08 04:28:46
Steel Code: AISC LRFD

| SIZE | # | LENGTH (ft) | WEIGHT (lbs) |
|---------|-------------|-------------|----------------|
| W24X55 | 49 | 1056.05 | 58574 |
| W24X62 | 20 | 640.00 | 39853 |
| W24X68 | 3 | 95.75 | 6549 |
| W24X76 | 268 | 9728.00 | 741490 |
| W27X84 | 8 | 150.00 | 12658 |
| W36X182 | 1 | 58.50 | 10670 |
| | 3130 | | 1121632 |

Total Number of Studs = 0

| ETABS TAKEOFF | | | |
|----------------------|----------|-------------|-----------|
| ElementType | Material | TotalWeight | NumPieces |
| Column | STEEL | 2945.134 | 516 |
| Beam | STEEL | 813.933 | 344 |
| Brace | STEEL | 1317.75 | 684 |
| Brace | 36KSI | 172.47 | 172 |



Gravity Column Design TakeOff

RAM Steel v11.2
DataBase: Takeoff Model - PLANKS
Building Code: IBC

04/08/08 06:09:34
Steel Code: AISC LRFD

Steel Grade: 50

I section

| Size | # | Length (ft) | Weight (lbs) |
|---------|----|-------------|--------------|
| W10X33 | 51 | 1883.7 | 62239 |
| W10X39 | 5 | 92.0 | 3600 |
| W12X40 | 13 | 486.2 | 19356 |
| W14X43 | 57 | 1828.2 | 78386 |
| W12X45 | 2 | 83.3 | 3715 |
| W14X48 | 8 | 211.7 | 10156 |
| W12X50 | 1 | 41.7 | 2070 |
| W12X53 | 3 | 109.8 | 5826 |
| W14X53 | 10 | 310.0 | 16456 |
| W12X58 | 1 | 41.7 | 2410 |
| W14X61 | 27 | 1098.4 | 66901 |
| W12X65 | 1 | 41.7 | 2708 |
| W10X68 | 4 | 105.7 | 7191 |
| W14X68 | 11 | 458.3 | 31193 |
| W14X74 | 7 | 291.7 | 21637 |
| W12X79 | 1 | 26.4 | 2085 |
| W14X82 | 17 | 708.4 | 57849 |
| W10X88 | 4 | 128.0 | 11281 |
| W14X90 | 25 | 1041.7 | 93934 |
| W12X96 | 1 | 32.0 | 3071 |
| W14X99 | 19 | 791.7 | 78394 |
| W14X109 | 16 | 651.4 | 70934 |
| W14X120 | 15 | 625.0 | 75076 |
| W14X132 | 10 | 401.4 | 53000 |
| W14X145 | 21 | 814.0 | 118277 |
| W12X152 | 1 | 32.0 | 4867 |
| W14X159 | 16 | 565.5 | 89866 |
| W14X176 | 10 | 416.7 | 73446 |
| W14X193 | 10 | 372.4 | 71982 |
| W14X211 | 16 | 567.0 | 119624 |
| W14X233 | 8 | 294.7 | 68685 |
| W14X257 | 12 | 439.0 | 112936 |
| W14X283 | 10 | 353.1 | 100084 |
| W14X311 | 3 | 79.3 | 24648 |
| W14X342 | 4 | 166.7 | 57282 |
| W14X370 | 4 | 128.0 | 47476 |
| W14X398 | 4 | 105.7 | 42069 |
| W14X426 | 4 | 128.0 | 54445 |
| W14X550 | 4 | 128.0 | 70560 |

436

1835714

Project AF 452
 Date 4/8/2008
 Engineer Steve Reichweit

Cost and Schedule Takeoff

Structure

| Description | Quantity | Unit | Daily Output | Labor Hours | Material | Labor | Equipment | Total | Total 15% O&P | Total Hours | 10 hr Days | Total Cost |
|----------------------------------|----------------|------|--------------|-------------|----------|------------|-----------|--------------|---------------|-------------|------------|-----------------|
| 400psi Topping Slab | 682570 | SF | | | | | | \$3.25 | \$3.75 | | | \$2,559,637.50 |
| 10" Precast Hollowcore Planks | 682570 | S.F. | 3600 | 0.002 | \$11.05 | \$1.21 | \$0.75 | \$13.01 | \$14.97 | 1517 | 152 | \$10,216,750.75 |
| Structural Steel - Beams | 1608 | Tcms | | | \$892.77 | \$1,962.61 | \$429.57 | \$3,304.35 | \$3,300.00 | | | \$6,106,959.23 |
| Structural Steel - Columns | 2629 | Tcms | | | \$892.77 | \$1,962.61 | \$429.57 | \$3,304.35 | \$3,300.00 | | | \$6,891,972.32 |
| Structural Steel - Braces | 819,621 | Tcms | | | \$892.77 | \$1,962.61 | \$429.57 | \$3,304.35 | \$3,300.00 | | | \$3,114,559.80 |
| Structural Steel - Labor Output | 5007 | Each | 40 | 0.25 | | | | | | 1252 | 125 | \$427,627.15 |
| Additional for Beam Connections | \$6,106,959.23 | Cost | | | | | | | 7.00% | | | \$999,197.23 |
| Additional for Column Splices | \$9,591,972.32 | Cost | | | | | | | 10.00% | | | \$622,911.96 |
| Additional for Brace Connections | \$3,114,559.80 | Cost | | | | | | | 20.00% | | | \$92,000.00 |
| Shear Studs | 15000 | Each | | | | | | \$5.00 | \$5.75 | | | |
| Tower Crane Jumps | 3 | | | | | | | | | 120 | 15 | |
| Plumbing and Bolting | | | | | | | | | | 120 | 15 | |
| | | | | | | | | | | 3009 | 308 | \$34,132,624.93 |
| | | | | | | | | Total | | | | \$47.47 |

Note: Shear studs taken at one slug per foot for transfer of lateral forces from diaphragm to braced frame.

Additional

| Description | Quantity | Unit | Material | Labor | Misc | Total | Total O&P | Total Cost |
|--|----------|---------|----------|--------|------|----------------|-----------|-----------------------|
| Curtain Wall | 15600 | SF | | | | | \$65.00 | \$1,326,000.00 |
| Elevators | 1.05 | % Incl. | | | | \$4,500,000.00 | | \$238,620.69 |
| MEP Increase | 1.05 | % Incl. | | | | | | \$1,300,000.00 |
| Fire Rated Gypsum Board Partitions | | | | | | | | |
| ANSI/JUL 263 Design No. U411 | 166667 | SF | \$1.35 | \$3.04 | | \$4.49 | \$5.16 | \$653,200.00 |
| Additional Shaft Wall Assembly | 16667 | SF | \$1.18 | \$2.77 | | \$3.95 | \$4.54 | \$75,708.33 |
| Gypsum Board Soffit - Beams | | | | | | | | |
| ANSI/JUL 263 Design No. NS01 | 21373000 | SF | \$1.16 | \$3.60 | | \$4.76 | \$5.47 | \$1,170,122.24 |
| Gypsum Board Soffit - Columns | | | | | | | | |
| ANSI/JUL 263 Design No. X518 | 82800 | SF | \$1.16 | \$3.60 | | \$4.76 | \$5.71 | \$472,953.60 |
| ANSI/JUL 263 Design No. X521 | | | | | | | | |
| Fire Resistant Drop Ceiling ANSI/JUL 263 Design No. D502 | 90800 | SF | \$1.12 | \$1.36 | | \$2.48 | \$3.35 | \$305,088.00 |
| | | | | | | | | \$5,871,692.86 |

| Cost Breakdown | |
|----------------|------------------------|
| Structural | \$34,132,624.93 |
| Additional | \$5,871,692.86 |
| Total | \$40,004,317.80 |